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ABSTRACT

These two units are designed to aid teachers in lesson planning in the secondary agricultural education curriculum in Missouri. The first unit, on meat identification, is to be taught as part of the first year of instruction in agricultural science, while the second unit, advanced meats, was prepared for use with 11th- and 12th-grade students in advanced livestock and marketing classes. The first unit consists of four lessons designed to develop competencies needed in meat identification. These lessons include: (1) introduction to meat classification, grading, and career opportunities; (2) identification of beef wholesale and retail cuts; (3) identification of pork wholesale and retail cuts; and (4) identification of lamb wholesale and retail cuts. The second unit contains three lessons designed to develop competencies in meat grading, evaluation and judging, and inspection. Each unit contains the lessons, unit objectives, competencies to be developed, motivational technique or interest objectives, study questions, references, teaching procedures, information sheets, activities, competencies, evaluation, and answers to evaluation questions. (KC)

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MEATS UNITS

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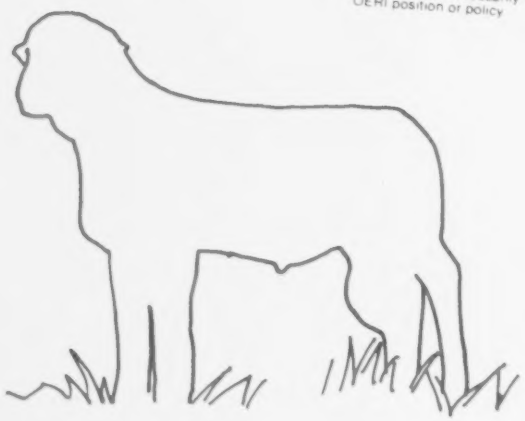

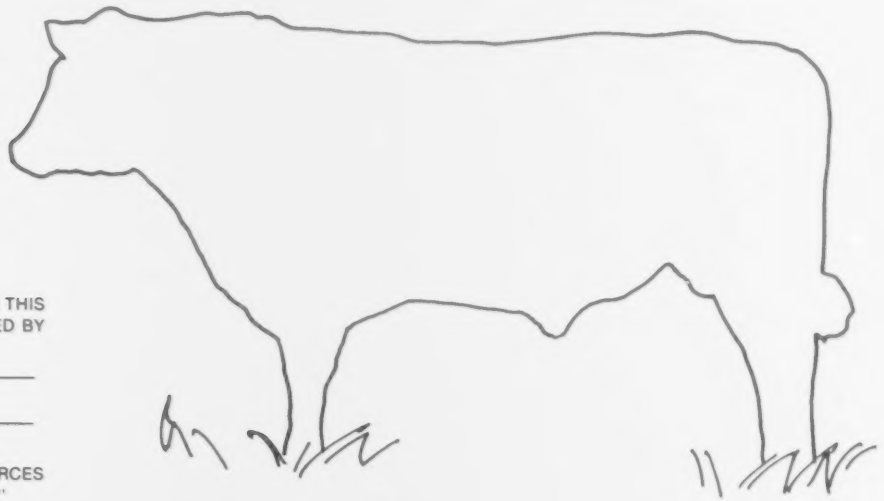

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INSTRUCTOR'S GUIDE

MEATS

Unit I: Meat Identification for Agricultural Science I (Four Lessons)

Unit II: Advanced Meats (Three Lessons)

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ACKNOWLEDGMENTS

These units, Unit I: Meat Identification for Agricultural Science I and Unit II: Advanced Meats for Advanced Livestock and Marketing Classes, represent a new addition to the current materials. These units were suggested by the MVATA Teaching Aids Committee.

The format of these lessons should aid teachers in lesson planning. These units have been reproduced in their entirety to use in planning the course sequence.

Special recognition is due to the Meats Curriculum Advisory Committee, which provided numerous suggestions for improvement that were incorporated into each of the units. Members of this committee included the following persons: Doug Funk, Delbert Lund, Bill Roberts, Marty Frick, Jim Schulze, Curtis Weston, and Terry Heiman.

Special recognition is also due to Dr. Harley Schlichting, director of the Instructional Materials Laboratory; Mary Anne Kercher, editor; and their staff for the typing, editing, and illustrating of these units.

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FOREWORD

The Meat Identification for Agricultural Science I and Advanced Meat Units have been developed as an addition to the curriculum available in vocational agriculture. These units were suggested by the MVATA Teaching Aids Committee. All lessons have been organized in a format to aid teachers in planning their lessons. Unit I is to be taught as a part of the first year of instruction and Unit II was prepared for use with 11th and 12th grade students of vocational agriculture.

Unit I: Meat Identification for Agricultural Science I consists of four lessons designed to develop competencies needed in meat identification. These lessons include: 1) Introduction to Meat Classification, Grading, and Career Opportunities; 2) Identification of Beef Wholesale and Retail Cuts; 3) Identification of Pork Wholesale and Retail Cuts; and 4) Identification of Lamb Wholesale and Retail Cuts.

Unit II: Advanced Meats contains three lessons designed to develop competencies in meat grading, evaluation, and inspection. These lessons include: 1) Meat Grading, 2) Meat Evaluation and Judging, and 3) Meat Inspection.

A separate publication, Meat Evaluation Handbook, should be secured in class quantities for use as a student reference for the lessons in both Units I and II.

During the summer of 1981, the Missouri State Board of Education formally adopted the concept of "Instructional Management Systems (IMS)" as a priority for the 1981-82 school year. Missouri Commissioner of Education Arthur L. Mallory has described the IMS concept as a practical way of "organizing for excellence" in education. To meet the demand for greater productivity and accountability, Dr. Frank Drake, Director of Vocational Education, applied the elements of IMS to form the Vocational Instructional Management System (VIMS). The VIMS process provides a framework to use in planning and organizing to assure excellence in Missouri's vocational education system by focusing greater attention on the management of teaching and learning.

To aid vocational agriculture teachers in the implementation of VIMS, this guide incorporates the needed component parts to meet VIMS requirements. For ease of use, performance objectives and competencies have been included at the beginning of each unit as well as being incorporated within each lesson. A competency profile has also been provided for convenient recordkeeping.

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MEATS

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Meats
Major Competency Profile

Directions: Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

Rating Scale:
3 **SKILLED** - can work independently with no supervision
2 **MODERATELY SKILLED** - can perform job completely with limited supervision
1 **LIMITED SKILL** - requires instruction and close supervison
N NO EXPOSURE - no experience or skill in this area

3	2	1	N	**Meats**
				Describe the general classification and grading of meat and identify career opportunities in the meat industry.
				Identify the wholesale and retail cuts of beef.
				Identify the wholesale and retail cuts of pork.
				Identify the wholesale and retail cuts of lamb.
				Describe the grading system for each class of meat.
				Describe how meat is evaluated and the steps in judging meat.
				Describe the meat inspection process.

Meats

Class/Section: _____

Students:	Describe the general classification and grading of meat and identify career opportunities in the meat industry	Identify the wholesale and retail cuts of beef	Identify the wholesale and retail cuts of pork	Identify the wholesale and retail cuts of lamb	Describe the grading system for each class of meat	Describe how meat is evaluated and the steps in judging meat	Describe the meat inspection process	

UNIT I

Meat Identification For Agricultural Science I

MEATS

UNIT I - Meat Identification for Agricultural Science I

LESSONS:

1. Introduction to Meat Classification, Grading, and Career Opportunities
2. Identification of Beef Wholesale and Retail Cuts
3. Identification of Pork Wholesale and Retail Cuts
4. Identification of Lamb Wholesale and Retail Cuts

OBJECTIVES:

1. The student will describe the general classification and grading of meat and identify career opportunities in the meat industry.
2. The student will identify the wholesale and retail cuts of beef.
3. The student will identify the wholesale and retail cuts of pork.
4. The student will identify the wholesale and retail cuts of lamb.

COMPETENCIES TO BE DEVELOPED:

1. Describe the general classification and grading of meat and identify career opportunites in the meat industry.
2. Identify the wholesale and retail cuts of beef.
3. Identify the wholesale and retail cuts of pork.
4. Identify the wholesale and retail cuts of lamb.

MOTIVATIONAL TECHNIQUE OR INTEREST APPROACH:

GETTING READY FOR THIS UNIT:

A. References and Materials:

The references and materials listed below are only suggestions. This does not imply that they must all be used. Using any of the suggested texts and a selection of the other materials should be sufficient to teach the unit successfully.

1. **Student Reference:** Meat Evaluation Handbook. National Livestock and Meat Board. (Available from the Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211)

2. Uniform Meat Identity Standards. National Livestock and Meat Board.

3. Audiovisual Materials (Available from the Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211; in Missouri - 800-392-7217, out of state - 314-882-2883):

   Meat Identification Slide Set #06-601, National Livestock and Meat Board

4. Handouts and transparencies for this curriculum guide are available from the Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211.

EVALUATION:

1. Give short, objective tests following each lesson and a more in-depth objective test at the conclusion of each unit.

2. Observe the changes in behavior as evidence of an improved ability of the students to deal with problems in this unit using background acquired from earlier units.

3. Observe students' atttempts to solve similar problems in their supervised occupational experience program.

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 1: Introduction to Meat Classification, Grading, and Career Opportunities

Objective: The student will describe the general classification and grading of meat and identify career opportunities in the meat industry.

Study Questions:

1. **How is meat classified?**
2. **How is meat graded?**
3. **What determines the quality of meat?**
4. **What careers are related to the meat industry?**

References:

1. Meat Evaluation Handbook, National Live Stock and Meat Board
2. Handouts
   a) HO 1: U.S.D.A. Grades for Meat (1983)
   b) HO 2: Meat Vocabulary Terms
3. Transparency Master
   a) TM 1: U.S.D.A. Grades for Meat (1983)

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 1: Introduction to Meat Classification, Grading, and Career Opportunities

TEACHING PROCEDURES

A. Introduction

Provide a general overview of the unit. Discuss the importance of each lesson objective and how it will be accomplished.

B. Motivation

Show some pictures of various types of tractors to the students. Then ask them which ones they would buy and why. They should give reasons such as "this one has a bigger engine" or "this is just the right size for doing the work I need." Point out that the way students could tell which tractor they needed or wanted was by the various characteristics each tractor exhibited.

Relate this type of discussion to meat classification and grading. Discuss with the students how meat is put into classes such as beef, sheep, or pork, based on its type of animal, just as tractors are arranged into various groups based on their horsepower ratings. Meat is further divided into groups which are distinguished by characteristics such as the amount of fat and age of the meat. This helps all persons who are involved in the meat industry, even the persons purchasing the meat for home cooking, to determine exactly what they are buying.

C. Assignment

D. Supervised Study

E. Discussion

NOTE: Use HO 2: Meat Vocabulary Terms, and discuss these with the class during the lesson.

1. Ask the students to describe the characteristics that are used in classifying meat.

How is meat classified?

1) Broad meaning of classes
   a) Carcasses and cuts derived from the same species or kind of animal (beef, pork, or mutton)
   b) Having a similar commercial use
2) Subclasses are determined within a class by the sex condition of the animal (heifer, sow, etc.).

2. Have students define what the terms grade and grading mean. Then refer students to HO 1, U.S.D.A. Grades for Meat (1983). Discuss and compare the different quality grades. Have students look at the pictures

of these quality grades in the reference. Continue the discussion by looking at the factors that determine the basis for grading and yield grades.

How is meat graded?

1) Meat grading
   a) Definitions
      (1) Grade: group or segment of a class of meat that is defined by a set of standards
      (2) Grading: the grouping of a segment of a class by desirable physical characteristics
   b) There are eight quality grades: Prime, Choice, Good, Standard, Commercial, Utility, Cutter, and Canner.
2) Basis for grading
   a) Measuring and comparing the more desirable parts (muscle) to the less desirable parts (fat, connective tissue, and bone) of the carcass or cut
   b) Evaluating the characteristics of meat that are associated with its palatability or quality (see next question)
3) Yield grade
   a) These grades identify the yield of boneless, closely trimmed retail cuts from a carcass.
   b) Characteristics that determine the yield grade for beef
      (1) Amount of external fat
      (2) Amount of kidney, pelvic, and heart fat
      (3) Area of the ribeye muscle
      (4) The carcass weight
   c) Characteristics that determine the yield grade for lamb and mutton
      (1) Amount of external fat
      (2) Amount of kidney and pelvic fat
      (3) Conformation grade of the leg

3. Ask the students to describe the characteristics that define the quality or palatability of meat.

What determines the quality of meat?

1) Quality - (The expected palatability of meat depends on three factors: maturity, marbling, and the characteristics of the fat and lean.
   a) Determine the maturity.
      (1) Maturity is determined by ossification of cartilages and bones and by the color and texture of the ribeye muscle.
      (2) The five maturity groups are labeled A through E.
      (3) Characteristics of the A maturity group (young carcasses)
         (a) Soft, porous chine bones that end with soft, pearly-white cartilages
         (b) Narrow, red rib bones
         (c) Sacral vertabrae with distinct separation
         (d) Cartilage present on the split aitch bone
         (e) Smooth, light-red ribeye muscle

(4) Characteristics of the E maturity group (old carcasses)
(a) Hard, white chine bones
(b) Cartilage outlines on the end of thoracic vertabrae barely visible
(c) Wide, flat rib bones
(d) Coarse, dark-red ribeye muscle

2) Marbling (quantity of intramuscular fat)
a) Coarse, heavy marbling or the lack of marbling is undesirable.
b) There are nine degrees of marbling. (See illustrations on page 26 of the Meat Evaluation Handbook.)

3) Characteristics of the lean and fat
a) Texture of the lean (prominence of muscle bundles)
(1) Associated with palatability
(2) Fine texture has few visible muscle bundles and little connective tissue and is the most desirable.
(3) Coarse texture has visible bundles with heavy connective tissue.
(4) Fine texture is associated with young beef and coarse texture with more mature beef.
b) Firmness of the lean and fat
(1) The lean should be firm and show no signs of surface moisture to be appealing.
(2) The fat should be firm and free from greasy or oily appearance to be appealing.
c) Color of the lean and fat
(1) Color of the lean gives an indication of maturity.
(2) Fat that is white to creamy-white is preferred.

4) Summary of excellent quality characteristics in a cut surface of meat
a) Full, well-developed, firm muscle
b) Fine-textured
c) Bright color
d) Liberal amount of marbling
e) Minimum of connective tissue

4. Ask the students to list all the careers that are related to the meat industry. Write these on the board. Discuss with the class what types of skills or knowledge about meats people would have to have to be employed in one of these occupations. Compare your list with the one below.

What careers are related to the meat industry?

1) Rancher
2) Meat inspector
3) Meat grader
4) Meat manager at the local grocery store
5) Meat processor (butcher)
6) Chef or cook
7) Livestock grader
8) Livestock buyer
9) Restaurant owner or food buyer
10) Homemaker

F. Other Activities

Have students visit a slaughter facility to see firsthand the different carcasses and grades.

G. Competency

Describe the general classification and grading of meat and identify career opportunities in the meat industry.

H. Answers to Evaluation

1. Class: The grouping of carcasses and meat cuts by the kind of animal and by its commercial use
2. Grade: A segment of a class that fits a defined set of characteristics
3. Grading: The actual grouping of classes into grades by their physical characteristics
4. Quality/Palatability: Describes those characteristics that make meat taste good and agreeable to people
5. Marbling: The amount of intramuscular fat or the amount of fat that is mixed with the muscle
6. Yield grade: The grade that identifies the amount of boneless, closely trimmed retail cuts that can come from a carcass
7. b, d
8. a, b, f
9. The list could include the items in the outline under Study Question 4 and others which are left to the instructor's discretion.

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Name _____

Date _____

Lesson 1: Introduction to Meat Classification, Grading, and Career Opportunities

EVALUATION

Give a short definition for each of the following terms.

1. Class:

2. Grade:

3. Grading:

4. Quality or Palatibility:

5. Marbling:

6. Yield Grade:

7. Given the following choices, which factor or factors are characteristics of the A maturity group in beef?

   a) Hard, white chine bones
   b) Ribeye muscle smooth in texture and light red in color
   c) Wide, flat rib bones
   d) Sacral vertabrae with distinct separation

8. Circle the statements below which are true about excellent quality meat.

   a) Firm fat
   b) Fine textured
   c) Heavy connective tissue
   d) Coarse texture
   e) Oily fat
   f) Bright color

9. List five occupations that are related to the meat industry.

   a)
   b)
   c)
   d)
   e)

U.S.D.A. Grades for Meat (1983)

Class or Kind		Grades
Beef[1]		
Quality Grades	(steer, heifer, cow)[2]	Prime, Choice, Good, Standard, Commercial, Utility, Cutter, Canner
	(bullock)	Prime, Choice, Good, Standard, Utility,
Yield Grades (cutability)		1, 2, 3, 4, 5
Calf		Prime, Choice, Good, Standard, Utility
Veal		Same as calf
Lamb, Yearling Mutton, and Mutton[3]-		
Quality Grades (lamb, yearling mutton)		Prime, Choice, Good, Utility
	(mutton)	Choice, Good, Utility, Cull
Yield Grades (cutability)		1, 2, 3, 4, 5
Pork	(barrows and gilts)	U.S. No. 1, U.S. No. 2, U.S. No. 3, U.S. No. 4, U.S. Utility
	(sows)	U.S. No. 1, U.S. No. 2, U.S. No. 3, Medium, Cull

1. Federally graded beef must be graded for both quality and yield.
2. Cows are not eligible for the Prime grade.
3. Federally graded lamb and mutton may be graded for quality or yield or both.

Source: National Live Stock Board, Meat Evaluation Handbook, page 20

Meat Vocabulary Terms

Class: The grouping of carcasses and meat cuts by the kind of animal and by its commercial use

Grade: A part of class that fits a defined set of characteristics

Grading: The actual grouping of classes into grades by their physical characteristics

Quality/Palatability: Describes those characteristics that make meat taste good or seem agreeable to people

Marbling: The amount of intramuscular fat or the amount of fat that is mixed in with the muscle

Yield Grade: The grade that identifies the amount of boneless, closely trimmed retail cuts that can come from a carcass

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 2: Identification of Beef Wholesale and Retail Cuts

Objective: The student will identify the wholesale and retail cuts of beef.

Study Questions:

1. **What are the wholesale cuts and bone structure of beef?**

2. **What are the retail cuts from each wholesale cut?**

References:

1. Meat Identification Slide Set #06-601, National Live Stock and Meat Board

2. Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

3. Handouts

   a) HO 3: Beef Chart
   b) HO 4: Wholesale Cuts and Bone Structure of Beef

4. Transparency Master

   a) TM 2: Wholesale Cuts and Bone Structure of Beef

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 2: Identification of Beef Wholesale and Retail Cuts

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Show some slides of different cuts of meats and ask the students to tell you the location of each of the cuts. Explain to the students that by identifying the location of meat cuts, an individual can determine the palatability or quality of the cut. This can be beneficial to a person throughout his/her lifetime as a consumer. This skill will also be essential to those individuals who plan a career in the meat industry.

C. Assignment

D. Supervised Study

E. Discussion

1. Discuss with the students each wholesale cut and the associated bone structure. Explain to the students that associating the bones with the cuts will make the identification of retail cuts easier.
(TM 2, HO 3)

NOTE: Students are not expected to list all bone structure refernces in their notebooks.

What are the wholesale cuts and bone structure of beef?

1) Chuck - contains the following bone structure
   a) Seven neckbones (cervical vertebrae)
   b) First through the fifth ribs
   c) Blade bone (scapula)
   d) Upper part of the arm bone (humerus)
   e) Back bones 1 through 5 (thoracic vertebrae)
2) Fore shank - contains the following bone structure
   a) Fore shank bones (ulna and the radius)
   b) Bottom parts of the arm bone (humerus)
   c) Elbow bone (Olecranon process)
   d) Front part of the breastbone (sternum)
3) Rib - contains the following bone structure
   a) Button (cartilage of spinious process)
   b) Back bones 6 through 13 (thoracic vertebrae)
   c) Sixth through twelfth ribs
4) Brisket - contains the following bone structure
   a) Third, fourth, and fifth ribs
   b) Breastbone (sternum)

5) Short plate - contains the following bone structure
   a) Sixth through the twelfth ribs
   b) Breastbone (sternum)
   c) Rib cartilages (costal cartilages)
6) Short loin - contains the following bone structure
   a) Twelfth and thirteenth backbones (thoracic vertebrae)
   b) First through the fifth backbones (lumbar vertebrae)
7) Flank (no bone structure)
8) Sirloin - contains the following bone structure
   a) Fifth and sixth backbones (lumbar vertebrae)
   b) First and second backbones (sacral vertebrae)
   c) Pelvic bone (pelvis)
   d) Hip bone (illum)
   e) The tip of the leg bone (femur)
9) Tip (no bone structure)
10) Round - contains the following bone structure
   a) Third through the fourth backbones (sacral vertebrae)
   b) Tail bone (caudal vertebrae)
   c) Pelvic bone (pelvis)
   d) Rump (aitch) bone (ischium)
   e) Leg (round) bone (femur)
   f) Knee cap (patella)
   g) Stifle joint (femro-tibial articulation)
   h) Hind shank bones (tibia)
   i) Hock bones (tibia and fibular tarsal bones)

2. Have the students identify the retail cuts from the wholesale cuts. Make sure that you point out the identifying bones and other identifying characteristics. Use the names below for the retail cuts which are consistant with the Missouri contest identification sheet. Use the slide set from the National Live Stock and Meat Board or one of similar quality in addition to the beef chart on HO 3.

What are the retail cuts from each wholesale cut?

1) Round
   a) Round steak
   b) Top round steak
   c) Bottom round steak
   d) Eye of round steak
   e) Sirloin tip cap on
   f) Sirloin tip cap off
   g) Heel of round
2) Rump
   a) Standing rump
   b) Rolled rump
3) Sirloin
   a) Pinbone sirloin steak
   b) Flat bone sirloin steak
   c) Wedge (round) bone sirloin steak
   d) Top sirloin butt steak
   e) Boneless sirloin steak

4) Short loin
   a) Porterhouse steak
   b) T-bone steak
   c) Club steak
   d) Top loin steak
   e) Tenderloin steak
5) Flank - flank steak
6) Rib
   a) Standing rib
   b) Rib steak
   c) Rib eye steak
   d) Rib eye roast
7) Short plate
   a) Plate bone in
   b) Rolled plate
   c) Short ribs
8) Chuck
   a) Arm pot roast
   b) Arm steak
   c) Blade pot roast
   d) Blade steak
   e) English (Boston) cut
9) Brisket
   a) Brisket bone in
   b) Boneless fresh brisket
   c) Corned beef brisket
10) Fore shank
   a) Fore shank
   b) Shank cross cuts
11) Variety meats
   a) Beef heart
   b) Beef tongue
   c) Beef for stew
   d) Ground beef
   e) Beef liver
   f) Beef kidney

F. Other Activities

Students need to be exposed to actual cuts of meat. This can be done by making arrangements with the local retail stores so you can bring in groups of students. Other good places to visit are the local butcher shop or a nearby meat packing facility.

G. Competency

Identify the wholesale and retail cuts of beef.

H. Answers to Evaluation

Part I:

1.	C	6	E
2.	G	7.	J
3.	D	8.	B
4.	I	9.	A
5.	H	10.	F

Name _____

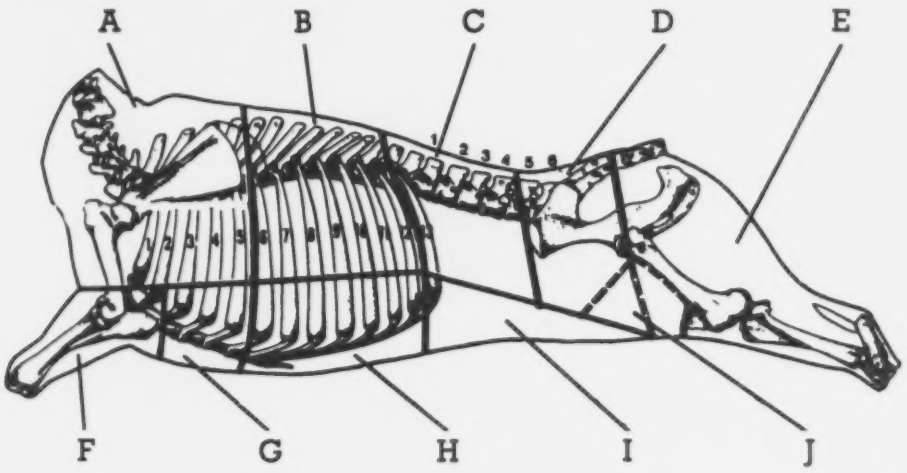
Date _____

EVALUATION

UNIT I-MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 2: Identification of Beef Wholesale and Retail Cuts

Part I: Write the letter of the correct wholesale cut in each blank.



___1. Short Loin
___2. Brisket
___3. Sirloin
___4. Flank
___5. Plate
___6. Round
___7. Tip
___8. Rib
___9. Chuck
___10. Shank

Part II: Identify the meat cuts on the slides provided by your instructor by writing the number of the correct slide in each blank.

Round
___Round Steak
___Top Round Steak
___Bottom Round Steak
___Eye of Round Steak
___Sirloin Tip Cap On
___Sirloin Tip Cap Off
___Heel of Round

Rump
___Standing Rump
___Rolled Rump

Sirloin
___Pinbone Sirloin Steak
___Flatbone Sirloin Steak
___Wedge (Round)
Bone Sirloin Steak
___Top Sirloin Butt Steak
___Boneless Sirloin Steak

Chuck
___Arm Pot-roast
___Arm Steak
___Blade Pot-roast
___Blade steaks
___English (Boston) Cut

Short Plate
___Plate (Bone in)
___Rolled Plate
___Short Ribs

Brisket
___Brisket (Bone in)
___Boneless Fresh Brisket
___Corned Beef Brisket

Fore Shank
___Fore Shank
___Shank Cross Cuts

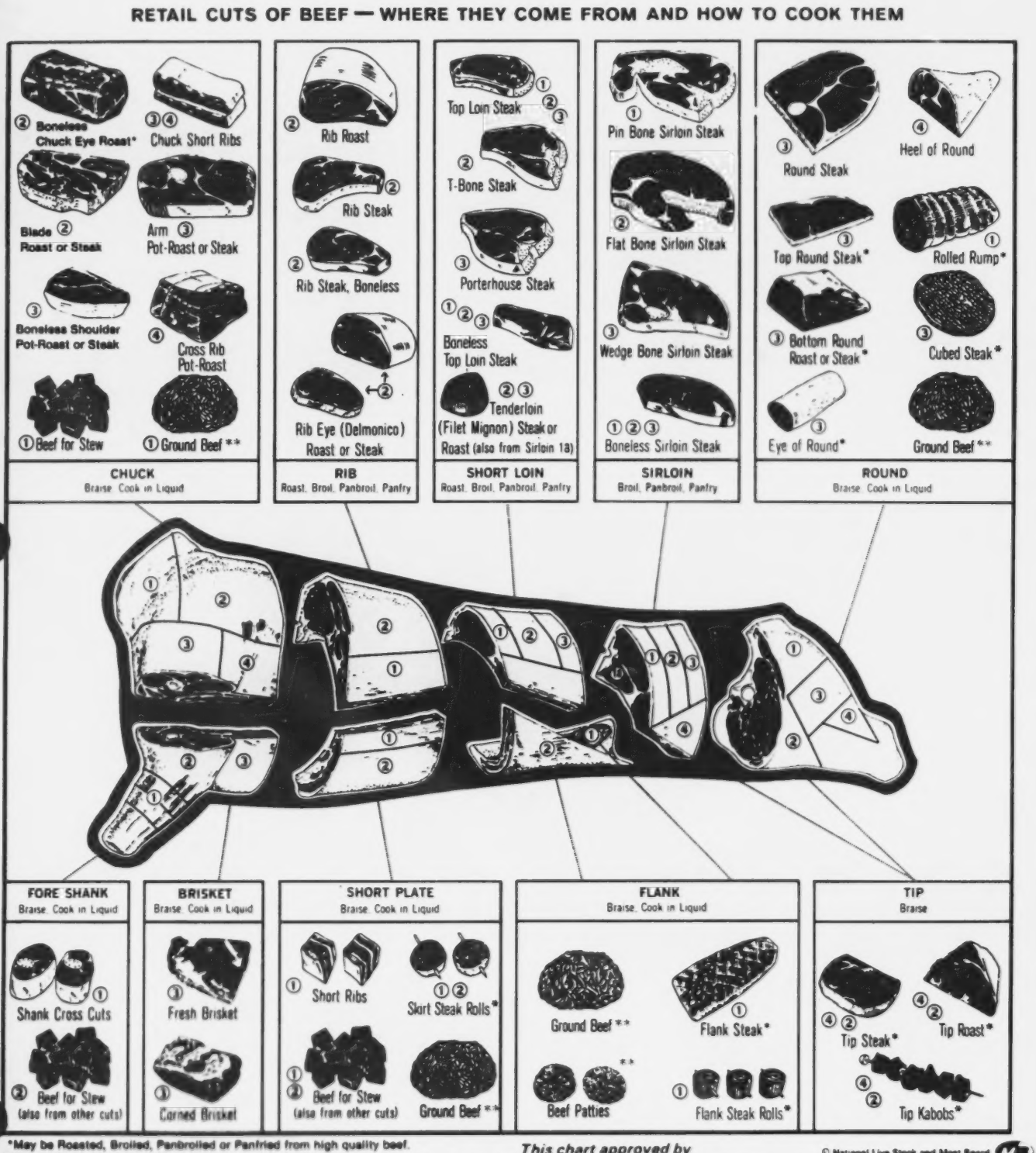
Short Loin
___Porterhouse Steak
___T-Bone Steak
___Club Steak
___Top Loin Steak
___Tenderloin Steak

Flank
___Flank Steak

Rib
___Standing Rib
___Rib Steak
___Rib Eye Steak
___Rib Eye Roast

Variety Meats
___Beef Heart
___Beef Tongue
___Sweetbreads
___Brains
___Beef for Stew
___Ground Beef
___Beef Liver
___Beef Kidney

Beef Chart


RETAIL CUTS OF BEEF — WHERE THEY COME FROM AND HOW TO COOK THEM
② Boneless Chuck Eye Roast*
③④ Chuck Short Ribs
Blade ② Roast or Steak
Arm ③ Pot-Roast or Steak
③ Boneless Shoulder Pot-Roast or Steak
④ Cross Rib Pot-Roast
① Beef for Stew
① Ground Beef **
CHUCK
Braise. Cook in Liquid
② Rib Roast
② Rib Steak
② Rib Steak, Boneless
Rib Eye (Delmonico) Roast or Steak
RIB
Roast, Broil, Panbroil, Panfry
Top Loin Steak ① ② ③
② T-Bone Steak
③ Porterhouse Steak
① ② ③ Boneless Top Loin Steak
② ③ Tenderloin (Filet Mignon) Steak or Roast (also from Sirloin 1a)
SHORT LOIN
Roast, Broil, Panbroil, Panfry
① Pin Bone Sirloin Steak
② Flat Bone Sirloin Steak
③ Wedge Bone Sirloin Steak
① ② ③ Boneless Sirloin Steak
SIRLOIN
Broil, Panbroil, Panfry
③ Round Steak
④ Heel of Round
③ Top Round Steak*
① Rolled Rump*
③ Bottom Round Roast or Steak*
③ Cubed Steak*
③ Eye of Round*
Ground Beef **
ROUND
Braise. Cook in Liquid
FORE SHANK
Braise. Cook in Liquid
① Shank Cross Cuts
② Beef for Stew (also from other cuts)
BRISKET
Braise. Cook in Liquid
③ Fresh Brisket
③ Corned Brisket
SHORT PLATE
Braise. Cook in Liquid
① Short Ribs
① ② Skirt Steak Rolls*
① ② Beef for Stew (also from other cuts)
Ground Beef **
FLANK
Braise. Cook in Liquid
Ground Beef **
① Flank Steak*
Beef Patties
① Flank Steak Rolls*
TIP
Braise
④ ② Tip Steak*
④ ② Tip Roast*
④ ② Tip Kabobs*
*May be Roasted, Broiled, Panbroiled or Panfried from high quality beef.
**May be Roasted, (Baked), Broiled, Panbroiled or Panfried.
This chart approved by
National Live Stock and Meat Board
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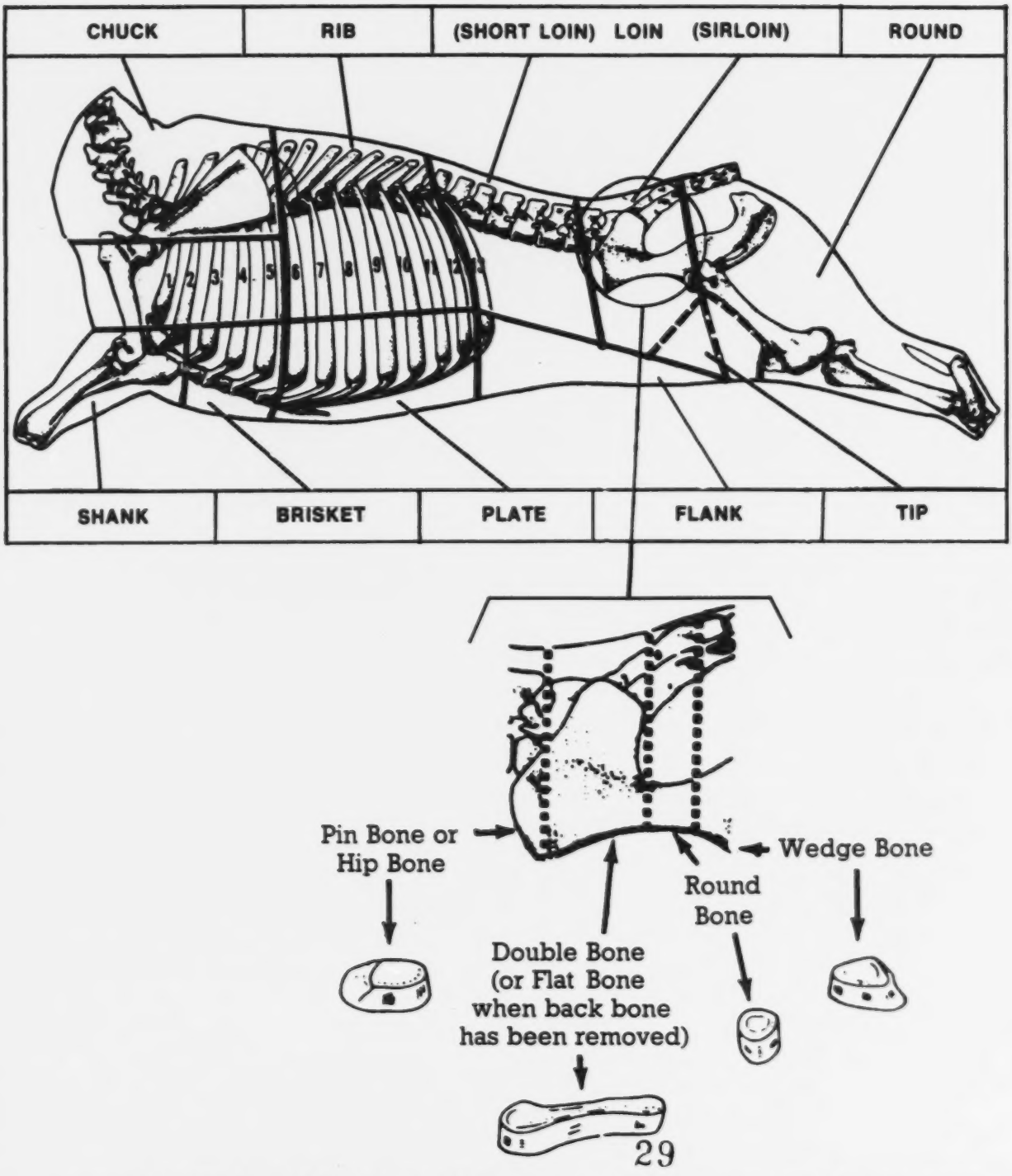
Source: Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

Wholesale Cuts and Bone Structure of Beef



Source: Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 3: Identification of Pork Wholesale and Retail Cuts

Objective: The student will identify the wholesale and retail cuts of pork.

Study Questions:

1. **What are the wholesale cuts and bone structure of pork?**

2. **What are the retail cuts from each wholesale cut?**

References:

1. Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

2. Meat Identification Slide Set #06-601, National Live Stock and Meat Board

3. Handouts

   a) HO 5: Pork Chart
   b) HO 6: Wholesale Cuts and Bone Structure of Pork

4. Transparency Master

   a) TM 3: Wholesale Cuts and Bone Structure of Pork

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 3: Identification of Pork Wholesale and Retail Cuts

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Show some pictures of delicious meals from magazines that picture different cuts of pork such as ham or pork chops. Explain to the students that recognizing where different cuts come from will enable them to choose the most tender cuts.

C. Assignment

D. Supervised Study

E. Discussion

1. Discuss with the students each wholesale cut and the bone structure associated with it. Explain to the students that recognizing the bone structures (their shapes and sizes) will make it easier to identify the retail cuts that come from each wholesale cut.

NOTE: Students are not expected to list all bone structure references in their notebooks.

What are the wholesale cuts and bone structure of pork?

1) Ham (fresh or smoked ham)
   a) Pelvic bone (pelvis)
   b) Rump (aitch) bone (ischium)
   c) Leg bone (femur)
   d) Tail bone (caudal vertebrae)
   e) Knee cap (patella)
   f) Stifle joint (femro-tibial articulation)
   g) Hind Shank bone (tibia)
   h) Hock bones (tibia and fibular tarsal bones)
2) Loin - consists of the following bone structure
   a) Backbones (thorasic, lumbar, and sacral vertebrae)
   b) Ribs
   c) Back part of the blade bone
   d) Front part of the hipbone (ilium)
3) Fresh side (belly, no bones)
4) Spare ribs - consist of the following bone structure
   a) Ribs
   b) Breastbone
   c) Rib cartilages (costal cartilages)

5) Picnic shoulder - consists of the following bone structure
   a) Arm bone (humerus)
   b) Fore shank bones (ulna and radius)
   c) Elbow bone (olecranon process)
   d) Breastbone (sternum)
   e) Ribs
   f) Bottom of the blade and neck bones
6) Blade Boston shoulder - consists of the following bone structure
   a) Neck bones (cervical vertebrae)
   b) Backbones (thoracic vertebrae)
   c) Blade bone (scapula)

2. Have the students identify the retail cuts from the wholesale cuts. Point out the identifying characteristics such as bones, general shape, color, location of muscles, etc. Use the categories and names listed below which are consistent with Missouri's contest identification sheet. Use the National Live Stock and Meat Board slide set or one of similar quality as well as HO 5 and HO 6 (TM 3).

What are the retail cuts from each wholesale cut?

1) Fresh pork
   a) Ham
      (1) Fresh ham, butt half
      (2) Fresh ham, shank half
      (3) Fresh ham, boneless
      (4) Fresh ham, center slice
   b) Loin
      (1) Center loin roast
      (2) Sirloin roast
      (3) Blade loin roast
      (4) Rib chop
      (5) Loin chop
      (6) Tenderloin
      (7) Back ribs
   c) Fresh side (belly)
   d) Spareribs
   e) Fresh picnic shoulder
      (1) Fresh picnic shoulder
      (2) Arm roast
      (3) Arm steak
   f) Boston butt
      (1) Fresh Boston butt shoulder
      (2) Blade steak
2) Pork (cured and smoked)
   a) Smoked ham
      (1) Smoked ham, butt half
      (2) Smoked ham, shank half
      (3) Smoked ham, center slice
   b) Smoked loin - smoked loin chops
   c) Smoked picnic shoulder - smoked picnic shoulder
   d) Smoked shoulder butt - smoked Boston shoulder roll

e) Bacon
   (1) Slab bacon
   (2) Sliced bacon
   (3) Jowl bacon square
   (4) Canadian-style bacon
f) Salt pork
   (1) Salt side
   (2) Salt fat back

3) Variety meats
   a) Pork tongue
   b) Sweet breads
   c) Brains
   d) Fresh pork sausage
   e) Fresh bulk sausage
   f) Pork liver
   g) Pork kidney

F. Other Activities

Again, it is suggested that students are taken to local retail stores and butcher shops to identify meat cuts.

G. Competency

Identify the wholesale and retail cuts of pork.

H. Answers to Evaluation

Part I

1. F
2. B
3. C
4. E
5. D
6. A

Part II

Using the meat identification sheet provided and a meat identification slide set, have students identify the pork retail cuts of meat and record them on their sheets.

Name _____

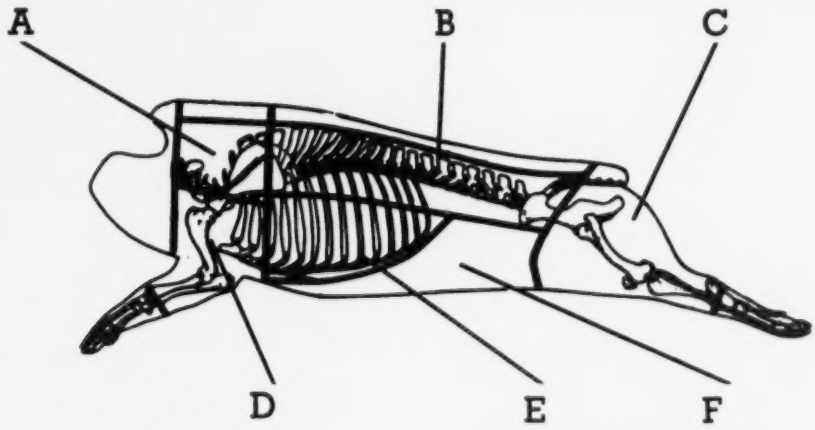
Date _____

Evaluation

UNIT I-MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 3: Identification of Pork Wholesale and Retail Cuts

Part I: Identify the wholesale cuts of pork by writing the correct letter in each blank.



___1. Fresh Side (Belly)
___2. Loin
___ 3. Ham
___ 4. Spareribs
___ 5. Picnic Shoulder
___ 6. Blade Boston Shoulder

Part II: Write the number of the slide in the blank which corresponds to the correct cut.

Pork (Fresh)

Ham

___Fresh Ham, Butt Half
___Fresh Ham, Shank Half
___Fresh Ham, Boneless
___Fresh Ham, Center Slice

Loin

___Center Loin Roast
___Sirloin Roast
___Blade Loin Roast
___Rib Chop
___Loin Chop
___Tenderloin
___Back Ribs

Fresh Side (Belly)

___Fresh Side

Spareribs

___Spareribs

Fresh Picnic Shoulder

___Fresh Picnic Shoulder
___Arm Roast
___Arm Steak

Boston Butt

___Fresh Boston Butt Shoulder
___Blade Steak

Pork (Cured and Smoked)

Smoked Ham

___Smoked Ham, Butt Half
___Smoked Ham, Shank Half
___Smoked Ham, Center Slice

Smoked Loin

___Smoked Loin Chops

Smoked Picnic Shoulder

___Smoked Picnic Shoulder

Smoked Shoulder Butt

___Smoked Boston Shoulder Roll

Bacon

___Slab Bacon
___Sliced Bacon
___Jowl Bacon Square
___Canadian-style Bacon

Salt Pork

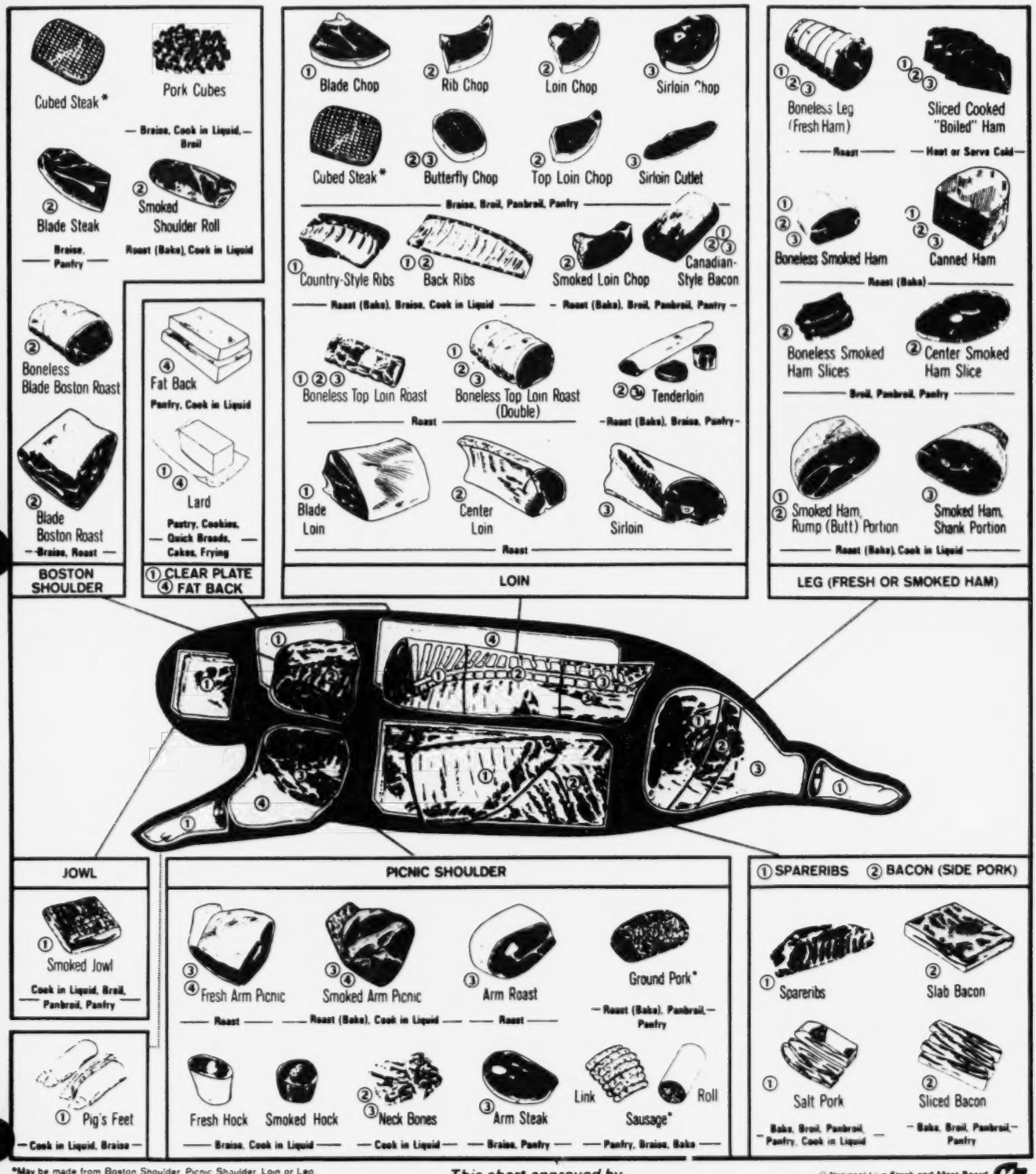
___Salt Side
___Salt Fat Back

Variety Meats

___Pork Heart
___Pork Tongue
___Sweetbreads
___Brains
___Fresh Pork Sausage
___Fresh Bulk Sausage

Pork Chart

RETAIL CUTS OF PORK — WHERE THEY COME FROM AND HOW TO COOK THEM



*May be made from Boston Shoulder, Picnic Shoulder, Loin or Leg.

This chart approved by
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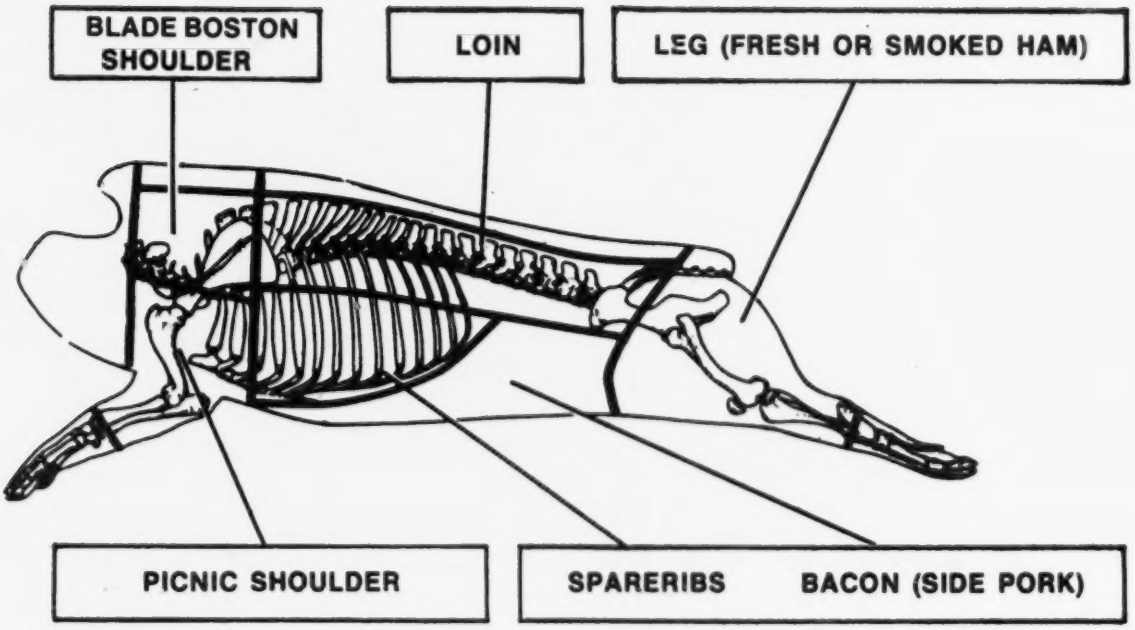
Source: Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

Wholesale Cuts and Bone Structure of Pork



UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 4: Identification of Lamb Wholesale and Retail Cuts

Objective: The student will identify the wholesale and retail cuts of lamb.

Study Questions:

1. **What are the wholesale cuts and bone structure of lamb?**

2. **What are the retail cuts from each wholesale cut?**

References:

1. Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

2. Meat Identification Slide Set #06-601, National Live Stock and Meat Board

3. Handouts

   a) HO 7: Lamb Chart
   b) HO 8: Wholesale Cuts and Bone Structure of Lamb

4. Transparency Master

   a) TM 4: Wholesale Cuts and Bone Structure of Lamb

UNIT I - MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 4: Identification of Lamb Wholesale and Retail Cuts

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Discuss with the students the fact that sheep and lamb production is often overlooked as a good source of meat products. The sheep and lamb industry has had steady growth in the state of Missouri in the last 20 years. In 1984 the total value for sheep and lamb meat production in Missouri was $5 million, the largest amount ever. Sheep, of course, not only provide income from their meat products, but they also give a yearly crop of wool. Another advantage of raising sheep is that they can do well on marginal pastures.

C. Assignment

D. Supervised Study

E. Discussion

1. Again, discuss with the students each wholesale cut and the bone structure associated with it. By now the students should recognize that the bone structure and wholesale cuts change little from species to species. This should enable the students to identify the final class easier than the first two classes.

NOTE: Students are not expected to list all bone structure references in their notebooks.

What are the wholesale cuts and bone structure of lamb?

1) Hind shank - consists of the following bone structure
   a) Hind shank bone (tibia)
   b) Hock bones (parts of tibia and fibular tarsal bones)
   c) Hind foot bones (metatarsal and phalangeal bones)
2) Leg - consists of the following bone structure
   a) Rump (aitch) bone (ischium)
   b) Leg (round) bone (femur)
   c) Knee cap (patella)
3) Sirloin - consists of the following bone structure
   a) Slip joint (sacro-iliac diathrosis)
   b) Hip bone (ilium)
4) Loin - consists of the following bone structure
   a) Backbones (thoracic and lumbar vertebrae)
   b) Ribs
5) Flank (no bone structure)

6) Rib - consists of the following bone structure
   a) Backbones (thoracic vertebrae)
   b) Top of ribs
   c) Feather bone (spinious process)
   d) Finger bone (transverse process)
7) Breast - consists of the following bone structure
   a) Breastbone (sternum)
   b) Rib cartilages (costal cartilages)
   c) Ribs
8) Shoulder - consists of the following bone structure
   a) Neck bones
   b) Blade bone (scapula)
   c) Backbone (thoracic vertebrae)
   d) Ribs
   e) Arm bone (humerus)
9) Neck - consists of the neck bones (cervical vertebrae)
10) Fore shank - consists of the following bone structure
   a) Fore shank bones (ulna and radius)
   b) Fore foot bones (carpal and metacarpal bones)
   c) Elbow bone (Olecranon process)
   d) Bottom of the arm bone

2. Have the students identify the retail cuts from the wholesale cuts. Point out the identifying characteristics such as bones, general shape, color, location of muscle, etc. Use the categories and names listed below which are consistent with Missouri's contest identification sheet. Use the National Live Stock Board slide set or one of similar quality along with the Lamb Chart. (HO 7, HO 8, TM 4)

What are the retail cuts from each wholesale cut?

1) Leg
   a) French leg
   b) American leg
   c) Leg steak
   d) Lamb leg, sirloin half
   e) Sirloin chops
2) Loin
   a) Loin roast
   b) Rib chops
3) Rack
   a) Rib roast
   b) Loin chops
4) Shoulder
   a) Square cut shoulder
   b) Rolled shoulder
   c) Arm chop
   d) Blade chop
5) Breast
   a) Breast
   b) Riblets
6) Shank
   a) Fore shank

7) Variety meats
   a) Lamb patties
   b) Lamb liver
   c) Lamb kidney

F. Other Activities

Students should be exposed to actual cuts of meat for practice in identification.

G. Competency

Identify the wholesale and retail cuts of lamb.

H. Answers to Evaluation

Part I:

1.	J	6.	I
2.	H	7.	B
3.	F	8.	C
4.	G	9.	D
5.	A	10.	E

Part II:

Use a slide set on lamb retail cuts and the identification sheet provided to test students in the identification of retail cuts.

Evaluation

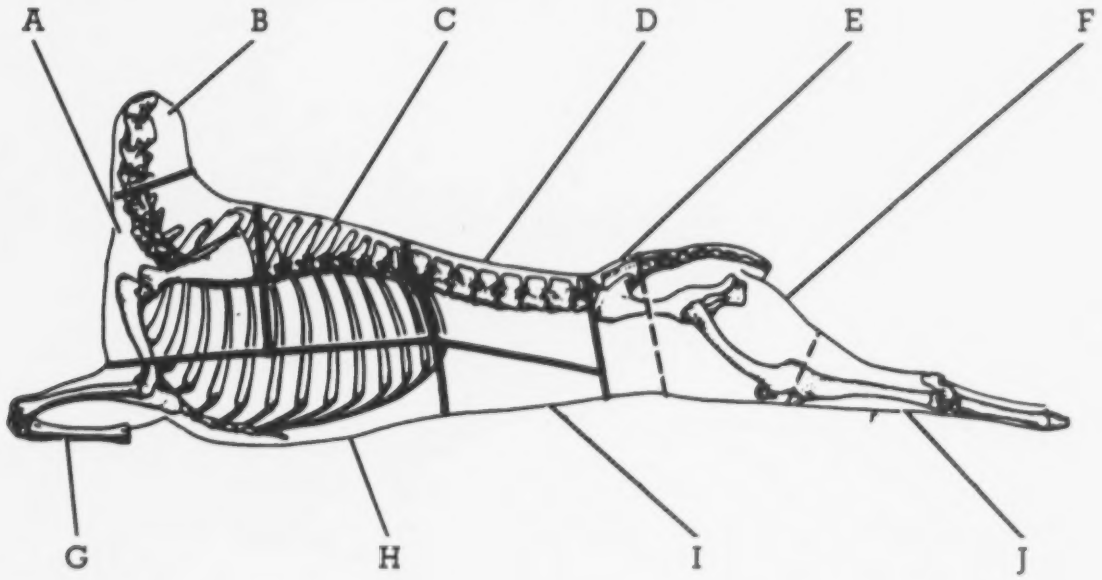
Name _____

Date _____

UNIT I-MEAT IDENTIFICATION FOR AGRICULTURAL SCIENCE I

Lesson 4: Identification of Lamb Wholesale and Retail Cuts

Part I: Identify the wholesale cuts of lamb by writing the correct letter in each space below.



___ 1. Hind Shank
___ 2. Breast
___ 3. Leg
___ 4. Fore Shank
___ 5. Shoulder
___ 6. Flank
___ 7. Neck
___ 8. Rack (Rib)
___ 9. Loin
___ 10. Sirloin

Part II: Identify each cut of lamb by writing the number of the correct slide in each blank.

Leg
___ Frenched Leg
___ American Leg
___ Leg Steak
___ Lamb Leg, Sirloin Half
___ Sirloin Chops

Loin
___ Loin Roast
___ Loin Chop

Rack
___ Rib Roast
___ Rib Chops

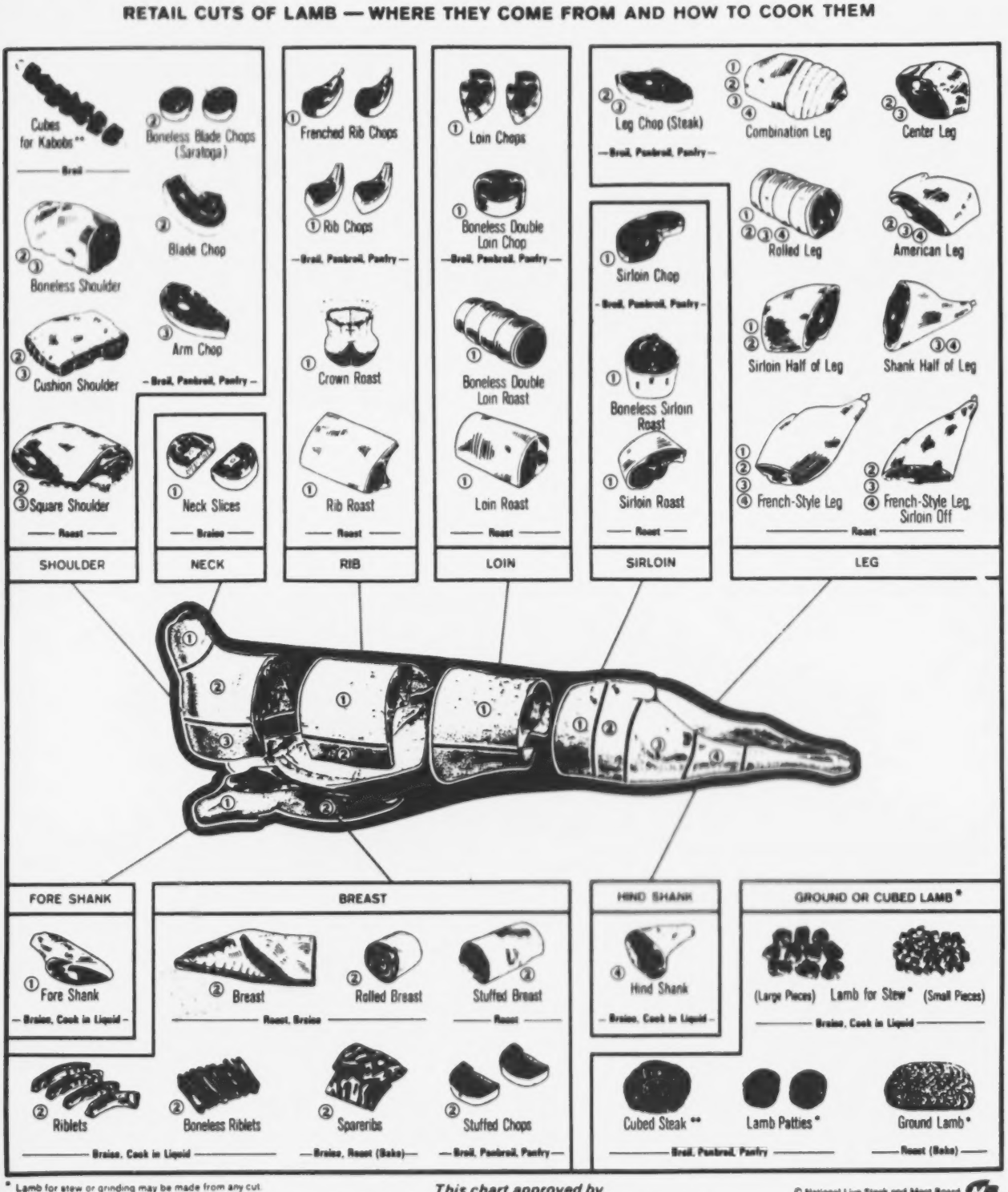
Shoulder
___ Square Cut Shoulder
___ Rolled Shoulder
___ Arm Chop
___ Blade Chop

Breast
___ Breast
___ Riblets (Breast)

Shank
___ Fore Shank

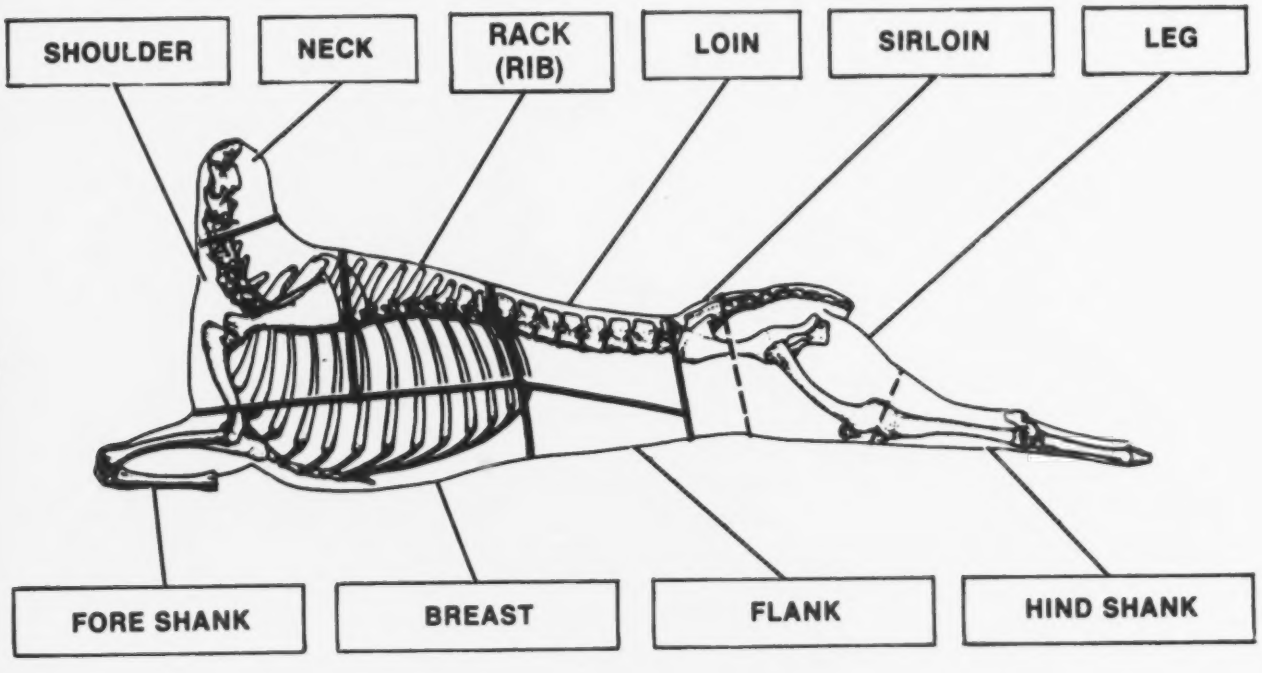
Variety Meats
___ Lamb Patties
___ Lamb Liver
___ Lamb Kidney

Lamb Chart



Source: Uniform Retail Meat Identity Standards, National Live Stock and Meat Board

Wholesale Cuts and Bone Structure of Lamb



Unit II

Advanced Meats

UNIT II - ADVANCED MEATS

LESSONS:

1. Meat Grading
2. Meat Evaluation and Judging
3. Inspection of Meat

OBJECTIVES:

1. The student will describe the grading system for each class of meat.
2. The student will describe how meat is evaluated and the steps in judging meat.
3. The student will describe the meat inspection process.

COMPETENCIES TO BE DEVELOPED:

1. Describe the grading system for each class of meat.
2. Describe how meat is evaluated and the steps in judging meat.
3. Describe the meat inspection process.

MOTIVATIONAL TECHNIQUE OR INTEREST APPROACH:

GETTING READY FOR THIS UNIT:

A. References and Materials:

The references and materials listed below are only suggestions. This does not imply that they must all be used. Using any of the suggested texts and a selection of the other materials should be sufficient to successfully teach the unit.

1. Meat Evaluation Handbook. National Livestock and Meat Board.
2. Romans, Jones, Costello, Carlson, and Ziegler. The Meat We Eat.
3. Handouts and transparencies for this curriculum guide are available from the Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211.

EVALUATION:

1. Give short, objective tests following each lesson and a more in-depth objective test at the conclusion of each unit.

2. Observe the changes in behavior as evidence of an improved ability of the students to deal with problems in this unit using background acquired from earlier units.

3. Observe students' attempts to solve similar problems in their supervised occupational experience programs.

UNIT II - ADVANCED MEATS

Lesson 1: Meat Grading

Objective: The student will describe the grading system for each class of meat.

Study Questions:

1. **How are beef grades determined?**
2. **How are yield grades determined for beef?**
3. **How is pork graded?**
4. **How are lamb and mutton graded?**

References:

1. Meat Evaluation Handbook, National Livestock and Meat Board
2. Handouts:
   a) HO 1: U.S.D.A. Grades for Meats (1983)
   b) HO 2: Definitions of Meat Terms
3. Transparency Master
   a) TM 1: U.S.D.A. Grades for Meats (1983)

UNIT II - ADVANCED MEATS

Lesson 1: Meat Grading

TEACHING PROCEDURES

A. Introduction

Provide a general overview of the unit. Discuss the importance of each lesson objective and how it will be accomplished.

B. Motivation

To place emphasis on the importance of grading and the classification of meat ask the students if they have heard of the following advertisement or one similar to it. The advertisement goes something like this: For the small fee of $4.99 you can be rid of all your household insect problems. This insect killer is guaranteed to work always, will last for years, and will kill any species and as many insects as you want. When the item is ordered, to the disappointment of the buyer, the insect eradicator turns out to be a wooden mallet and block. The directions state that you should place the bug on the block and strike it with the mallet. Although this is a bit extreme, it illustrates the point that without a system of classifying the type and quality of meat, buyers will not be able to establish fair and equal prices for each meat product.

C. Assignment

D. Supervised Study

E. Discussion

1. Review the terms on HO 2 before starting the discussion about Study Question 1. Start the discussion by asking the students to list the steps in grading beef for quality. Describe how the Marbling, Maturity, and Carcass Quality Grade Chart can be interpreted. Continue by describing how yield grades are determined.

   NOTE: The Marbling, Maturity and Quality Grade Chart is on page 21 of the reference. Also refer students to HO 1 and TM 1: U.S.D.A. Grades for Meat, and use this TM 1 for each of the study questions.

   How are beef grades determined?

   1) Determine the class or kind of meat, beef, veal, or calf.
   2) Determine the sex classification
      a) Bull beef is not quality graded.
      b) Cow beef is not eligible for the Prime grade.
      c) Bullock beef ("A" mature bulls) are not eligible for Prime, Commercial, Cutter, and Canner grades.

d) Factors used in determining the sex classification
   (1) Steer carcasses
      (a) Rough, irregular fat in the cod region
      (b) Small pelvic cavity
      (c) Small pizzle eye
      (d) Curved aitch bone
      (e) Bald spot or lean area above the aitch bone
   (2) Heifer carcass
      (a) Smooth fat in the region of the udder
      (b) Larger pelvic cavity than the steer
      (c) Straighter aitch bone than steers
      (d) More angular and less thickly fleshed than steers
   (3) Cow carcasses
      (a) Large pelvic cavity
      (b) Straight aitch bone
      (c) Hips slightly prominent
      (d) Most cows are marketed at an advanced age.

3) Determine the maturity.
   a) Maturity is determined by ossification of cartilages and bones and the color and texture of the rib eye muscle.
   b) Five maturity groups labeled A through E
   c) Characteristics of the A maturity group (young carcasses)
      (1) Soft porous chine bones that end with soft pearly-white cartilages.
      (2) Rib bones narrow and red
      (3) Sacral vertebrae with distinct separation
      (4) Cartilage present on the split aitch bone
      (5) Rib eye muscle smooth in texture and light red in color
   (d) Characteristics of the E maturity group (old carcasses)
      (1) Hard, white chine bones
      (2) Cartilage outlines on the end of thoracic vertabrae barely visible
      (3) Rib bones wide and flat
      (4) Rib eye muscle dark red and coarse in texture
4) Determine the degree of marbling and the firmness of the rib eye.
   a) Firmness of the lean is seldom a limiting factor.
   b) There are nine degrees of marbling. (See illustrations on page 26 of the Meat Evaluation Handbook.)
5) Determine the final quality grade. (See chart on page 21 of the Meat Evaluation Handbook.)
   a) Use a chart comparing the degrees of marbling and maturity.
   b) Convert the degree of marbling and maturity to percentages.
   c) Use the percentages to locate the quality grade.

NOTE: If the instructor determines that it is necessary for students to learn how to determine the fractional portion of a grade, she or he can have students follow through the discussion on page 22 in the Meat Evauation Handbook.

2. Start the discussion by pointing out to the students that yield grades are important because they classify beef into groups according to the types of carcasses will give the largest quantity of meat. Continue by pointing out the characteristics used and work through a couple of problems using both methods of determining yield grades.

How are yield grades determined for beef?

1) Yield grade
   a) There are five grades numbered from one through five.
   b) Grade No. 1 has the highest cutability or yield and Grade No. 5 the lowest.
   c) Yield grades are determined without regard to sex or quality grade.
   d) Determining characteristics
      (1) Amount of external fat
         (a) Measure the thickness of the fat over the rib eye muscle at a point three-fourths of the length of the rib eye from the chine bone end.
         (b) Adjustments may be made to the above measurement to reflect unusual amounts of fat.
      (2) Amount of kidney, pelvic, and heart fat
         (a) Measured subjectively
         (b) Expressed as a percent of the carcass weight
      (3) The ratio of meat to bone
      (4) The measuring of the palatability characteristics of meat
2) Factors used in grading
   a) Conformation
      (1) The proportion of more desirable to less desirable parts
      (2) The ratio of meat to bone or the percentage of usable meat
   b) Quality (the expected palatability of meat)
      (1) Measured by the amount of marbling or the presence of intramuscular fat
      (2) Firmness of fat and lean
      (3) Determining factors for degree of maturity or age
         (a) Color and texture of the lean
         (b) Size and shape of the rib bones
         (c) Ossification of cartilage
      (4) Summary of excellent quality characteristics in a cut surface of meat
         (a) Full, well-developed firm muscle
         (b) Fine-textured lean
         (c) Bright color
         (d) Liberal amount of marbling
         (e) Minimum of connective tissue
   c) Finish - the amount, distribution, and character of the external and internal fat
   d) Area of the rib eye muscle
      (1) Muscle exposed at the 12th and 13th ribs
      (2) May be subjectively evaluated or may use a grid or other measuring device

e) Warm carcass weight
   (1) Hot carcass weight
   (2) Chilled carcass weight X 102 percent

3) Finding Yield Grade by equation

Yield Grade = 2.50
+ (2.50 x adjusted fat thickness in inches)
+ (0.20 x percent kidney, pelvic, and heart fat)
+ (0.0038 x hot carcass weight in pounds)
- (0.32 x area of rib eye in square inches)

4) Finding yield grade by practical method (See page 23 of the Meat Evaluation Handbook for a detailed explanation of this procedure.)

a) Determine a "preliminary yield grade" by tenths using this schedule.

Thickness of Fat Over the Rib Eye*	Preliminary Yield Grade
.2 inch	2.5
.4	3.0
.6	3.5
.8	4.0
1.0	4.5
1.2	5.0
1.4	5.5
1.6	6.0

*This measurement should be adjusted as necessary, to reflect unusual amounts of fat on other parts of the carcass.

b) Determine the final yield grade (1 to 5) by adjusting the schedule below.

Warm Carcass Weight (lbs.)	Area of Rib Eye (sq. in.)	Warm Carcass Weight (lbs.)	Area of Rib Eye (sq. in.)
		675	11.9
350	8.0	700	12.2
375	8.3	725	12.5
400	8.6	750	12.8
425	8.9	775	13.1
450	9.2	800	13.4
475	9.5	825	13.7
500	9.8	850	14.0
525	10.1	875	14.3
550	10.4	900	14.6
575	10.7	925	14.9
600	11.0	950	15.2
625	11.3	975	15.5
650	11.6	1000	15.8

(1) Adjust the preliminary yield grade for area up or down by .3 according to this guide.

(2) Adjust the preliminary yield grade by adding .2 for every percent over 3.5 percent of kidney, pelvic, and heart fat and by subtracting .2 for every percent of kidney, pelvic, and heart fat.

3. Have the students list the different sex categories for pork. Then have them describe how these are determined and which grades can be assigned to each sex category. Continue the discussion by describing the characteristics used in assigning grades.

How is pork graded?

1) Determining sex categories for assigning grades (TM 1)
   a) Barrow carcasses
      (1) Small pizzle eye
      (2) A pocket in the split edge of the belly from the preputial sheath removal
   b) Gilt carcasses
      (1) A smooth, split edge of the belly
      (2) Absence of a pizzle eye
      (3) Undeveloped mammary tissue
   c) Sow carcasses
      (1) A smooth, split edge of the belly
      (2) Developed mammary tissue
   d) Stag
      (1) Pocket in the split edge of the belly
      (2) Pizzle eye larger and more prominent than in the barrow
      (3) Heavy shoulders with thick skin over shoulders
      (4) Large bones and joints
      (5) Dark red lean
   e) Boar - same characteristics as the stag only more pronounced
2) Assigning grades (TM 1)
   a) There are no official grades for boar and stag carcasses.
   b) Barrows and gilts can be graded U.S. No. 1, No. 2, No. 3, No. 4, and U.S. Utility
   c) Sows can be graded U.S. No. 1, No. 2, No. 3, Medium, and Cull.
3) Considerations for assigning grades (Use chart on page 43 of the Meat Evaluation Handbook.)
   a) Quality-indicating characteristics of the lean
      (1) Usually observe the cut surface of the loin eye muscle at the 10th rib for marbling, firmness, and color.
      (2) Other major muscle cut surfaces can be used.
      (3) In absence of a cut surface, quality-indicating characteristics can be used.
         (a) Firmness of fat and lean
         (b) Amount of feathering between ribs
         (c) Color of lean
      (4) Carcasses with unacceptable lean are graded U.S. Utility.
      (5) Carcasses with acceptable lean are graded U.S. No. 1 through U.S. No. 4.

b) Expected combined yields of the four lean cuts (ham, loin, picnic shoulder, and Boston butt)
   (1) Factors used to estimate yields
      (a) Average thickness of backfat (See Figure 1, page 47 of Meat Evaluation Handbook.)
      (b) Cases where the average thickness of backfat is not representative of the degree of fatness
         i) Measurements are made in other areas, such as outside of hams, directly anterior to the hip bone, over the edge of the loin, and at the point where the belly and shoulder meet.
         ii) Adjustment is then made in the average backfat.
      (c) Carcass length or weight
      (d) Muscling
         i) Inverse relationship exists between muscling and fat with carcasses of the same weight or length.
         ii) Six degrees of muscling are very thick, thick, moderately thick, slightly thin, thin, and very thin. (See Figure III on page 49 in the Meat Evaluation Handbook.)
   (2) Expected yields for each grade (See illustrations on page 51 in the Meat Evaluation Handbook.)
      (a) U.S. No. 1 - 53 percent and over
      (b) U.S. No. 2 - 50 to 52.9 percent
      (c) U.S. No. 3 - 47 to 49.9 percent
      (d) U.S. No. 4 - less than 47 percent

4. Start the discussion of this study question by asking the students to list and describe the classes in ovines. Follow this by describing the major factors used in determining quality grades and conclude with a discussion on how yield grades are determined.

How are lamb and mutton graded?

1) Classes of ovines
   a) Classes determined by physical evidences of maturity
      (1) Color and texture of the lean
      (2) Ossification of bones
      (3) Shape of the bones
   b) Descriptions of each class (See illustrations on page 55 of Meat Evaluation Handbook.)
      (1) Lamb
         (a) Break-joint on front shank fairly red, moist with well-defined ridges
         (b) Rib bones slightly wide and moderately flat
         (c) Light red lean with fine texture
      (2) Yearling mutton
         (a) Break-joints or spool joints on the front shanks
         (b) Moderately wide rib bones which tend to be flat
         (c) Lean with slightly dark red color

(3) Mutton
(a) Usually has spool joints
(b) Wide, flat rib bones
(c) Lean dark red and coarse in texture

c) Classes are assigned regardless of sex identification.
d) Ram carcasses may be discounted one grade.

2) Quality grades (See illustrations on pages 63 and 64 of the Meat Evaluation Handbook.)
a) Conformation
(1) Proportion of edible meat to bone
(2) Proportion of weight of carcass in more closely trimmed cuts
(3) Conformation may compensate for quality in all grades except Prime.

b) Quality
(1) Determining factors (Note the chart on page 59 of the Meat Evaluation Handbook.)
(a) Fat streakings inside the flank muscles (See illustrations on page 62.)
(b) Maturity (See illustrations on page 61.)
(c) A minimum degree of lean and fat trimness is specified for each grade.
(d) Maturity can be compensated for by other quality factors when determining grades.
(2) Applicable grades by class (TM 1)
(a) Lamb, yearling mutton: Prime, Choice, Good, Utility
(b) Mutton: Choice, Good, Utility, Cull

3) Yield grades (See illustrations on pages 65 and 66.)
a) Determined from expected yield of closely trimmed retail cuts, leg, loin, hotel rack, and shoulder
b) Five yield grades
(1) Yield Grade 1 represents the highest yield of retail cuts.
(2) Yield Grade 5 represents the lowest yield of retail cuts.
c) Yield grades assigned without regard to quality grades
d) Determining factors
(1) Amount of external fat (amount of fat thickness over the rib eye between the 12th and 13th rib)
(2) Amount of kidney and pelvic fat, measured subjectively and expressed as a percent of the carcass weight
(3) Conformation grade of the legs
(a) Fifteen is High Prime and one is Cull.
(b) Increase in leg conformation increases the percentage of retail cuts.
(c) A change of one full grade in leg conformation changes the yield grade by 15 percent.
e) Yield grade equation

Yield Grade = 1.66
- (0.05 x leg conformation code)
+ (0.25 x percent kidney and pelvic fat)
+ (6.66 x adjusted fat thickness in inches)

f) Short cut method

(1) Determine preliminary yield grade. (See the table on page 61.)

Fat Thickness Over Rib Eye*	Preliminary Yield Grade
.05 inch	2.33
.10	2.67
.15	3.00
.20	3.33
.25	3.67
.30	4.00
.35	4.33
.40	4.67
.45	5.00
.50	5.33
.55	5.67
.60	6.00

*This fat thickness measurement over the rib eye muscle should be adjusted, as necessary, to reflect unusual amounts of fat on other parts of the carcass.

(2) Adjust the preliminary grade.

(a) Add 0.25 for every percent of kidney and pelvic fat over 3.5 percent

(b) Subtract 0.25 for every percent of kidney and pelvic fat under 3.5 percent.

(c) Subtract 0.05 for each one-third of a grade that the leg conformation exceeds Average Choice.

(d) Add 0.05 for each one-third of a grade that the leg conformation is less than Average Choice.

F. Other Activities

Have students visit a slaughter facility to see firsthand the different carcasses and grades.

G. Competency

Describe the grading system for each class of meat.

H. Answers to Evaluation

1. Determining the sex
2. Color and texture of the rib eye muscle
3. True
4. Quality of the lean and the expected combined yields of the four lean cuts (ham, loin, picnic shoulder, and Boston butt)
5. Lamb, yearling mutton, and mutton

6. Full, well-developed firm muscle, fine-textured lean, bright color, liberal amount of marbling and a minimum of connective tissue.
7. d
8. b
9. d
10. a, c

UNIT II - ADVANCED MEATS Name _____

Lesson 1: Meat Grading Date _____

EVALUATION

1. What is the first step in beef grading?

2. Beef maturity is determined from two main factors. One is ossification of cartilages and bones. What is the other determining factor?

3. Is the following statement true of false? _____
Sex and quality of a carcass are not used in determining yield grades for a beef carcass.

4. What are the two main characteristics used to assign grades to pork after the sex is determined?

   a)

   b)

5. List the three classes of ovines.

   a)

   b)

   c)

6. List three excellent quality characteristics in a cut surface of meat.

   a)

   b)

   c)

Circle the letter in front of the best answer(s) in each of the following questions.

7. Which of the following factors is an indicator of a beef steer carcass?

   a) Smooth fat in the utter region
   b) Straight aitch bone
   c) Large pelvic cavity
   d) Rough, irregular fat in the cod region

8. Which of the following is a characteristic of A maturity group carcasses?

   a) Hard, white chine bones
   b) Rib bones narrow and red
   c) Rib eye muscle is dark red and coarse in texture
   d) Rib bones are wide and flat

9. Choose the characteristics usually present in mutton carcasses from the following list.

   a) Break-joints on the front shanks
   b) Dark red lean; coarse in texture
   c) Wide, flat rib bones
   d) Spool joints

10. Circle the statement or statements that are true about yield grades.

   a) The yield grades identify the yield of boneless, closely trimmed, retail cuts from a carcass.
   b) Quality grades help to determine yield grades.
   c) The amount of external fat is a factor in determining yield grades for beef, mutton, and lamb.
   d) There are separate quality and yield grades for pork.

U.S.D.A. Grades for Meat (1983)

Class or Kind		Grades
Beef[1]		
Quality Grades	(steer, heifer, cow)[2]	Prime, Choice, Good, Standard, Commercial, Utility, Cutter, Canner
	(bullock)	Prime, Choice, Good, Standard, Utility,
Yield Grades (cutability)		1, 2, 3, 4, 5
Calf		Prime, Choice, Good, Standard, Utility
Veal		Same as calf
Lamb, Yearling Mutton, and Mutton[3]-		
Quality Grades (lamb, yearling mutton)		Prime, Choice, Good, Utility
	(mutton)	Choice, Good, Utility, Cull
Yield Grades (cutability)		1, 2, 3, 4, 5
Pork	(barrows and gilts)	U.S. No. 1, U.S. No. 2, U.S. No. 3, U.S. No. 4, U.S. Utility
	(sows)	U.S. No. 1, U.S. No. 2, U.S. No. 3, Medium, Cull

1. Federally graded beef must be graded for both quality and yield.
2. Cows are not eligible for the Prime grade.
3. Federally graded lamb and mutton may be graded for quality or yield or both.

Source: National Live Stock Board, Meat Evaluation Handbook, page 20

DEFINITIONS OF MEAT TERMS

Aitch: the back part of the pelvic or hip bone

Cartilage: clear, flexible tissue that is along the edge of bones and turns hard and white in older carcasses

Conformation: the proportion of meat to bone and the comparison of the more desirable parts to the less desirable parts of a carcass

Finish: the amount, distribution, and character of external and internal fat

Marbling: a measure of the amount of fat intermixed in the lean

Ovines: relating to or resembling sheep

Ossification: the hardening of bone tissue

Pizzle eye: muscle that attaches the penis

Quality: the expected palatability of meat

Yield: the amount or quantity of meat cuts that can be obtained from a carcass

UNIT II - ADVANCED MEATS

Lesson 2: Meat Evaluation and Judging

Objective: The student will describe how meat is evaluated and the steps in judging meat.

Study Questions:

1. **How is beef evaluated for quality?**
2. **What are the characteristics that predict cutability of beef?**
3. **How is the pork carcass evaluated?**
4. **How are fresh hams evaluated?**
5. **How is lamb evaluated for cutability?**
6. **How is lamb evaluated for quality?**
7. **What are the steps in meat judging?**

Reference:

1. Meat Evaulation Handbook, National Live Stock and Meat Board

UNIT II - ADVANCED MEATS

Lesson 2: Meat Evaluation and Judging

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Explain to the students that, whether the student will be involved in raising livestock, buying, selling, processing, or just consuming meat; it's important to be able to evaluate carcasses and cuts to determine the best quality and yield.

C. Assignment

D. Supervised Study

E. Discussion

1. Explain to the students that the characteristics used in evaluating meat are based on the consumer's demand for high quality, lean beef with a minimum of waste from either fat or bone.

How is beef evaluated for quality?

1) Characteristics that predict high quality are usually measured at the rib eye muscle
2) Twofold importance of quality to evaluation
   a) Appearance to consumers
   b) Palatability - tenderness, flavor, and juiciness
3) Attributes of beef quality
   a) Maturity
      (1) Associated with palatability
      (2) Young carcass skeletons with split dorsal processes which are soft, red, and porous with soft, white pearly cartilage on the top
      (3) Mature skeletal characteristics
         a) Dorsal processes become harder and whiter and the cartilage ossifies.
         b) These changes first start with the posterior vertebrae and move toward the anterior vertebrae.
      (4) Color change with maturity
         a) Veal is pale pink.
         b) Yearling is bright cherry red.
         c) Older beef is deep, dark red.
   b) Marbling
      (1) Associated with palatability
      (2) Coarse heavy marbling or the lack of marbling is undesirable.

c) Texture of the lean (prominence of muscle bundles)
   (1) Texture is associated with palatability.
   (2) Fine texture has few visible muscle bundles and little connective tissue (the most desirable).
   (3) Coarse texture has visible bundles with heavy connective tissue.
   (4) Fine texture is associated with young beef and coarse texture with more mature beef.

d) Firmness of the lean and fat
   (1) The lean should be firm and show no signs of surface moisture to be appealing.
   (2) The fat should be firm and free from greasy or oily appearance to be appealing.

e) Color of the lean and fat
   (1) Color of the lean gives an indication of maturity.
   (2) Fat that is white to creamy-white is preferred.

2. Explain to the students that cutability is simply determining the amount of retail cuts that can be obtained from a particular carcass. Ask the students to list the characteristics used in determining cutability.

What are the characteristics that predict cutability of beef?

1) The proportion of the carcass that is salable as trimmed retail cuts
2) This proportion or yield which is greatly influenced by excess fat and the amount of muscling
3) Characteristics of cutability
   a) Finish
      (1) Finish is the amount of fat covering wholesale cuts and body cavity fat.
      (2) Some fat is needed to reduce carcass shrinkage and lengthen shelf life.
      (3) Acceptable amount of fat is .3 inch over the rib eye at the 12th rib.
      (4) Considering the total amount of trim marble fat is the most important consideration.
   b) Muscle development
      (1) This is usually not considered important in determining cutability as finish.
      (2) Heavily muscled beef with a desirable finish will have carcasses that are irregular in contour. (See pictures on page 8 in Meat Evaluation Handbook.)
      (3) Rounds should be wide, plump, and long in the cushion and have a minimum amount of trimmable fat. (See pictures on pages 7 and 15 in the reference.)
      (4) The rib eye at the 12th rib should be long, uniformly wide and extend well into the blade portion of the wholesale rib. (See pages 6 and 9 of the reference.)
      (5) The chuck should be thick and full from the back with minimum trimmable fat. (See pages 6, 16, and 17 of the reference.)
      (6) The brisket, plate, and flank should be as trim as possible.

(7) The most imporant concept of muscling is to keep in mind the ratios of lean to bone and lean to fat.

3. Discuss with the students how one of the most important considerations in the evaluation of pork is a critical consumer market that desires less fat and higher quality lean. (See pictures on page 42 of the reference.)

How is the pork carcass evaluated?

1) Basis for pork evaluation or cutability
   a) Expected yield of the lean cuts, ham, loin, arm, picnic, and blade
   b) Quality lean factors
      (1) Firmness of fat and lean
      (2) Color of fat and lean
      (3) Marbling
      (4) Texture of the lean
   c) Yields of the lean cuts expressed as a percent of the carcass weight
      (1) This is determined by the predictive values of the amount of trimmable fat and muscling.
      (2) The amount of muscling has increased and the amount of trimmable fat has decreased in recent years.
2) Finish - degree of fatness of the carcass
   a) Cut out value of carcasses is determined largely from the ratio of lean cuts to amount of trimmable fat.
   b) Variation in the amount of fat is the most important factor affecting yields of lean cuts.
   c) Fat should be firm and not oily.
   d) The fat cover should not be excessive over the back and the loin edge.
3) Muscular development
   a) The size of loin eye is the most important factor in determining the amount of muscling.
   b) After considering the amount of trimmable fat as well as the thickness and plumbness of the carcass, muscling is considered.
4) Certain shapes of wholesale cuts need to be considered.
   a) Thickness and plumbness of the ham
   b) Fullness of the loin
   c) Turn over loin
   d) Depth of chine
   e) Thickness of the shoulder
   f) Thickness of the belly

4. Start the discussion by explaining to the students that, since the ham is the most valuable retail cut in pork, it is evaluated by a separate set of characteristics. (See pictures on pages 41, 44, and 45 in the reference.)

How are fresh hams evaluated?

1) Muscling
   a) Ham must be broad and deep.
   b) Ham must be long when measured from the aitch bone to the stifle.
   c) The amount of excessive fat needs to be taken into consideration.
2) Quality
   a) Exposed lean is firm, fine-textured, and uniformly bright greyish pink in color.
   b) The lean should be marbled with firm, white fat.
   c) Exterior fat is firm, white, and dry.
   d) Skin is smooth and fine-grained.
   e) Undesirable characteristics
      (1) Color from ashen grey to dark red
      (2) Two tone color, with muscles closer to the bone being darker
      (3) Coarse, stringy texture
      (4) No or little marbling
      (5) Pale colored, watery lean

5. Tell the students that lamb evaluation is also concerned with evaluating carcasses to determine the yield of desirable consumer retail cuts, acceptable appearance, and palatability. Continue the discussion by describing the carcass traits that predict the cutability of lamb carcasses.

How is lamb evaluated for cutability?

1) Cutability - proportion of carcass weight that is salable at the retail counter
2) Finish - amount of external and internal fat
   a) A carcass with a normal distribution of fat will have a bluish tint along the back of the carcass.
   b) The leg and shoulder are the last places where fat is deposited.
   c) The flank, back, sirloin, cod, udder, and breast are areas where excess fat is deposited.
   d) Kidney and pelvic fat may range from one to nine percent of the carcass weight with lamb carcasses. (See pictures on page 57 of the reference.)
   e) The ideal lamb carcass has a finish that is uniform with about 0.1 inch of fat over the rib eye and a small amount of fat in areas of high fat deposition.
3) Muscle development (See pictures on pages 56 and 57 of the reference.)
   a) The size of the muscle in loin or rib chops is important to consumers.
   b) The size of the muscle development in the leg is a good indicator of overall muscling.
   c) The rib eye size is very important because many are too small to meet consumer desires.
   d) A muscular, properly finished carcass will not be uniform in width.

e) A carcass with uniform width indicates excessive finish.
f) Shoulders and legs are comparable in width and wider than the loin and rack in a desirable carcass.

6. Explain to the students that the quality of lamb is determined by those factors which affect the consumers acceptance of the meat. Have the students list and discuss each of the factors used in determining quality.

How is lamb evaluated for quality?

1) Ribbed carcasses are evaluated for
   a) Marbling
   b) Texture and color in the rib eye
   c) Maturity
2) Unribbed carcasses are evaluated for
   a) Color of the lean and fat
      (1) Desirable flank color is bright pink.
      (2) Color of the fat should be white.
   b) Firmness of lean and fat
      (1) Evaluated at the flank, legs, and back
      (2) Associated with increased degrees of fat and therefore is indirectly related to low cutability
   c) Flank streaking and feathering
      (1) A poor estimate of the amount of marbling
      (2) Flank streaking evaluated in the abdominal cavity
   d) Maturity
      (1) Break-joints (See pictures on page 55 of the reference.)
         (a) The foot may be removed at the break-joint until an ovine animal is 12 to 14 months old.
         (b) If the joint is dark red, the carcass may be graded as a yearling.
      (2) Lambs may be identified as being younger by having narrow, round ribs and a considerable redness in the shank bone.

7. Tell the students that, when they are judging classes of meat, they have to compare the characteristics that are present in each exhibit. The students must then place the exhibits and be able to defend their placement. Stress that the students need to recognize the characteristics which were discussed previously that distinguish the quality and cutability of the meat.

What are the steps in meat judging?

1) Develop a system to observe all major points.
2) Rank each individually and divide into pairs for judging.
3) Rank each paired exhibit according to the characteristics mentioned previously for each class.

G. Competency

Describe how meat is evaluated and the steps in judging meat.

H. Answers to Evaluation

1. a) Quality - those attributes of meat that contribute to the appearance and palatability of meat
   b) Cutability - that proportion of the carcass that is salable as trimmed retail cuts
2. C
3. D
4. A
5. B
6. E
7. fat
8. firmness of fat and lean
   color of fat and lean
   marbling
   texture of the lean
9. carcass
10. aitch
11. bluish tint
12. leg
13. break-joint (spool joint)
14. Answers may include the following:
    a) Develop a system of observation.
    b) Rank each exhibit individually and then divide them into pairs for evaluation.
    c) Rank the exhibits according to the characteristics that measure quality and cutability.

UNIT II - ADVANCED MEATS Name _____

Lesson 2: Meat Evaluation and Judging Date _____

EVALUATION

1. List the two main characteristics that are used in evaluating meat and give a brief definition of each.

   a)

   b)

Match the following terms in beef evaluation on the left with the best descriptors on the right by placing the appropriate letters in the spaces provided.

_____	2.	Young carcass	A.	Few muscle bundles
_____	3.	Yearling	B.	Amount of exterior and interior fat
_____	4.	Fine texture	C.	Soft, white, pearly cartilage
_____	5.	Finish	D.	Cherry red lean
_____	6.	Important concept of muscling	E.	The ratio of lean to bone or fat
			F.	Fat that is white to creamy white

7. The variation in the amount of _____ is the most important factor affecting the yield in the lean cuts of pork.

8. Name three of the lean quality factors when evaluating pork.

   a)

   b)

   c)

9. Yields of the lean cuts in pork are expressed as a percentage of the _____ weight.

10. Fresh hams must be long as measured from the _____ bone to the stifle.

11. A lamb carcass with a normal distribution of fat will have a _____ _____ along the back of the carcass.

12. The size of muscling in the _____ is a good indication of overall muscling in a lamb carcass.

13. The best judge of maturity in an ovine carcass is by the _____.

14. List two important steps in meat judging.

a)

b)

UNIT II - ADVANCED MEATS

Lesson 3: Inspection of Meat

Objective: The student will describe the meat inspection process.

Study Questions:

1. **What are the laws governing meat inspection?**
2. **What are the basic elements involved in meat inspection?**
3. **What are the common causes of carcass value loss?**

References:

1. Romans, Jones, Costello, Carlson, and Ziegler, The Meat We Eat
2. Handout
   a) HO 3: Meat Inspection

UNIT II - ADVANCED MEATS

Lesson 3: Inspection of Meat

TEACHING PROCEDURES

A. Review the previous lesson.

B. Motivation

Ask the students why meat needs to be inspected. Explain that, unlike other perishable food, meat is subject to some of the same diseases that human bodies are subject to, and for our protection meat inspection needs to be governed by strict regulation.

C. Assignment

D. Supervised Study

E. Discussion

1. Briefly discuss the legislative acts that have been passed concerning the inspection of meat. Continue by pointing at the procedures that are directed by the laws.

What are the laws governing meat inspection?

1) Meat Acts
   a) Meat Inspection Act of 1906 and Poultry Products Inspection Act of 1957
      (1) Only applied to animals being slaughtered
      (2) Covered products for interstate and foreign commerce only
   b) Wholesome Meat Act of 1967
      (1) Applied to intrastate processors and slaughterers, as well as interstate and foreign transportation of meat
      (2) Main thrust was to make the various state inspection systems at least equal to federal standards.
      (3) Antemortem inspection was made mandatory for all cattle, sheep, swine, goats, horses, mules, and other equine animals.
   c) Secretary of the U.S. Department of Agriculture is responsible for administering the federal meat inspection laws.
   d) The laws implement the following inspection program.
      (1) Examination of animals at the time of slaughter
      (2) Inspection of all stages of processing for
         (a) Sanitary handling
         (b) Sanitation of equipment, buildings, and grounds
      (3) The destruction of condemned products
      (4) Examination of products used in meat preparation

(5) Determining and applying identification standards to inspected meat products
(6) Ensuring informative labeling
(7) Prohibiting false and deceptive labeling
(8) Inspection of foreign meat that is imported
(9) Certifying meat for export

2. Explain to the students that the following seven items must be checked in meat processing and slaughtering facilities to assure that the resultant products are wholesome.

What are the basic elements involved in meat inspection?

1) Live and carcass inspection
   a) Antemortem (before slaughter)
   b) Postmortem (after slaughter)
2) Reinspection - carried out during processing
3) Sanitation - processing equipment and personnel
4) Potable water
5) Sewage and waste disposal control
6) Pest control
7) Condemned and inedible material control

3. Ask the students to name some common causes of animal loss. There may be some that are more prevalent locally than the ones listed below. Compare the list and talk about preventive measures.

What are the common causes of carcass value loss?

1) Pregnancy
2) Trichnia
3) Swine (Porcine) stress syndrome
4) Jowl abcesses
5) Swine Dysentary
6) Brucellosis
7) Cattle grubs
8) Shipping loss (both causes and prevention)

F. Other Activities

Have your local or area inspector come to the class and give a short talk about his or her job.

G. Competency

Describe the meat inspection process.

H. Answers to Evaluation

1. T
2. T
3. T
4. T
5. F
6. F

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7. Answers can include, but are not limited to, the following:

Pregnancy
Trichnia
Swine stress syndrome
Jowl abcesses
Swine Dysentary
Brucellosis
Cattle grubs
Shipping loss

UNIT II - ADVANCED MEATS Name _____

Lesson 3: Inspection of Meat Date _____

EVALUATION

The following statements are either true or false. Circle the T in front of those statements that are true and circle the F in front of the statements that are false.

T F 1. The Wholesome Meat Act of 1967 made antemortem inspection of animals mandatory.

T F 2. The main focus of inspection laws is to control meat products so that they are wholesome and safe for consumers.

T F 3. Postmortem inspection occurs after the animal has been killed.

T F 4. Potable water is an essential part of a meat processing facility.

T F 5. The major cause of meat loss in cattle is Brucellosis.

T F 6. Pork stress syndrome is caused by a microorganism.

7. List four causes of carcass value loss.

a)

b)

c)

d)

MEAT INSPECTION

The Meat Inspection Act of 1906 and the Poultry Products Inspection Act of 1957 applied only to the animals slaughtered and those products that were processed for interstate and foreign commerce, but did not apply to intrastate commerce. Small slaughterhouses and processors doing a strictly local business were not required to comply with the provisions of these acts. They only needed to comply with nonuniform and often poorly enforced city or state laws. To improve upon this situation, the Wholesome Meat Act was enacted by Congress and signed into law by President Johnson on December 15, 1967. This law provided for a state-federal cooperative program, under which all intrastate slaughter and processing plants were to be placed under state supervision. The act provided for federal financial, technical, and laboratory assistance in setting up state meat inspection programs that were equivalent to the federal standards. Individual states were given two years in which to bring their meat inspection programs up to these standards. Some states failed to act, and the federal government has taken over all meat inspection services within them.

When the Wholesome Meat Act was passed in 1967, the provisions of this act and those of the Federal Meat Inspection Act of 1906, and its amendments, were consolidated into one Federal Meat Inspection Act. Under the provisions of the current act, antemortem inspection is now mandatory for all cattle, sheep, swine, goats, horses, mules, and other equine animals. Under the provisions of the act of 1906, antemortem inspection was not mandatory, but the secretary of agriculture, at his discretion, could require an antemortem inspection of all cattle, sheep, swine, and goats.

Application and Enforcement of Inspection Laws

The secretary of the United States Department of Agriculture is given the responsibility of administering federal meat inspection laws and is also authorized to promulgate regulations that will implement these laws and enable him to effectively administer their provisions. The federal inspection program, as conducted by the Animal and Plant Health Inspection Service, consists of (1) the examination of animals and of their carcasses at the time of slaughter, (2) inspection at all stages of the preparation of meat and meat food products to assure sanitary handling, the sanitation of equipment, buildings, and grounds, (3) the destruction of condemned product to prevent its use for human food, (4) the examination of all ingredients used in the preparation of meat food products to assure their fitness for food, (5) the prescription and application of identification standards for inspected meat food products, (6) the enforcement of measures that insure informative labeling, (7) the prohibition of the use of false and deceptive labeling, (8) the inspection of foreign meat and meat food products that are offered for importation, and (9) the administration of a system of certification to assure acceptance of domestic meats and meat food products in foreign commerce.

Basic Elements in Meat Inspection

1) Antemortem (before slaughter) and postmortem (after slaughter) inspection
   a) Antemortem
      (1) Made the day of slaughter
      (2) Animals are condemned if they are dying or show symptoms of disease.
      (3) Animals are marked "suspect" if not plainly showing symptoms and may be condemned at postmortem inspection.
   b) Postmortem
      (1) Inspection is made simultaneously with slaughtering.
      (2) Head, organs, glands, and viscera are inspected.
      (3) Whole carcasses or just parts may be condemned or passed.
2) Reinspection (processing)
   a) Each step in the preparation of processed meats is inspected.
   b) All formulas and ingredients must be approved by the U.S.D.A.
3) Sanitation
   a) Processing and handling must proceed without contamination.
   b) Equipment must be cleaned at regular intervals.
   c) Personnel must practice good personal hygiene.
4) Potable water
   a) Potable water is free of disease causing germs.
   b) All water used in a facility must be potable.
5) Sewage and waste disposal control
6) Pest control
   a) Must control pests to eliminate contamination.
   b) Must have preventative and exterminating procedures.
7) Condemned and inedible material control - Condemned meat products must remain under inspection control until they are made incapable of use for human consumption.

Common Causes of Loss

1) Pregnancy - Flesh in females is not normal during pregnancy.
2) Trichnia
   a) Microscopic parasite found in humans and swine
   b) Swine infected by eating infected rats or the flesh of other infected animals
   c) Parasite destroyed by heating and freezing infected meat products
3) Swine (Porcine) stress syndrome (PSS)
   a) Caused by management practices such as handling, transporting, and sudden environmental change
   b) Causes death and the meat will be dark, firm, and dry, or pale, soft, and watery
4) Jowl abscesses
   a) Little agreement on cause
   b) No general accepted control
5) Swine dysentary
   a) Higher for those producers marketing 500 or more swine a year
   b) Higher for those farms that purchase feeder pigs

6) Brucellosis
   a) Contagious to humans (Unduland Fever)
   b) Causes abortions and delays in breeding
7) Cattle grubs
   a) Two kinds generally found in the United States
      (1) Common grub - found in all 48 continental states
      (2) Northern cattle grub
   b) Cause the greatest loss in cattle
      (1) Lower gains
      (2) Lower milk production
      (3) Meat must be trimmed or discarded.
      (4) Hide value is reduced.
8) Shipping loss (causes and prevention)
   a) Keep fences, feed racks, and shelters in good repair and free from nails.
   b) Keep feed lots free from trash and machinery.
   c) Dehorn cattle.
   d) Don't crowd cattle.
   e) Use a canvas slapper, not a rod or whip.
   f) See that there are no protrusions on truck racks.
   g) Cover the truck floor with sand for good footing.
   h) Have cleated floors on loading chutes.
   i) Take your time when loading.
   j) Separate mixed loads with partitions.
   k) Cover the front end of the truck.
   l) Drive carefully, avoiding sudden stops and quick turns.

Credit:

Forrest, J.C., Aberle, E.D., Hedrick, H.B., Judge, M.D., and Merkel, R.A. Principles of Meat Science. San Francisco: W.H. Freeman and Company, 1975.